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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/801,433	03/07/2001	Sami Haapoja	872.0034USU	7094

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EXAMINER	
TRAN, PABLO N	

ART UNIT	PAPER NUMBER
2685	7

DATE MAILED: 04/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/801,433	HAAPOJA ET AL.	
	Examiner	Art Unit	
	Pablo N Tran	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5,6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-5, 9-14, 18-23, and 27-30 are rejected under 35 U.S.C. 102(e) as being anticipated by *Maddiotto et al.* (6,690,735).

As per claims 1, 11, 20, and 29-30, *Maddiotto et al.* disclosed a mobile station having a downconverter circuitry for downconverting received RF signals to in-phase (I) and quadrature (Q) channel signals each comprising a plurality of sub-carriers at a low intermediate frequency (low-IF) and, if required, one sub-carrier or a single carrier centered around 0 Hz; analog low pass filters having tunable corner frequencies for filtering interfering signals outside of a frequency band of interest in the I and Q channels; I and Q channel analog-to-digital converters for converting I and Q channel signals to digital representations thereof; I and Q channel quadrature downmixers for separating sub-carriers that are images of one another by quadrature downmixing the digital representations of the I and Q channel signals to baseband in the digital domain;

and digital adder logic for selectively adding or subtracting resulting I and Q signals to obtain one or both of an upper sideband and a lower sideband containing desired ones of the sub-carriers (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claims 2, 12, and 21, *Maddiotto et al.* disclosed tuning a local oscillator to a center frequency of a group of sub-carriers (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claims 3, 13, and 22, *Maddiotto et al.* disclosed tuning a local oscillator between a middlemost sub-carrier and its interfering adjacent channel (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claim 4, *Maddiotto et al.* disclosed wherein digital filtering provides a final selectivity for each of the sub-carriers (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claims 5, 14, and 23, *Maddiotto et al.* disclosed a wideband analog low pass filter is replaced by narrower filters having bandwidths set by the bandwidth of the individual sub-carriers, and whose center frequencies are one of fixed or tunable (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claim 9, *Maddiotto et al.* disclosed wherein in the multi-carrier reception case the receiver gain in analog circuitry is adjusted based on the power of all sub-carriers, or if the sub-carrier spacing is sufficiently small, is based on the power of one of the sub-carriers (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claim 10, *Maddiotto et al.* disclosed wherein in the multi-carrier reception case the receiver gain in digital circuitry is adjusted separately for each sub-carrier, or if

the sub-carrier spacing is sufficiently small, all sub-carriers are provided the same digital gain (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claims 18 and 27, *Maddiotto et al.* disclosed digital logic for measuring sub-carrier power in the multi-carrier reception case (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

As per claims 19 and 28, *Maddiotto et al.* disclosed the receiver further comprises, for each sub-carrier, a digital gain block for independently adjusting sub-carrier power (abstract, fig. 2, 9-10, col. 5/ln. 36-col. 11/ln. 34).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6-7, 15-16, and 24-25 rejected under 35 U.S.C. 103(a) as being unpatentable over *Maddiotto et al.* (6,690,735) in view of *Torii* (6,219,534).

As per claims 6, 15, and 24, *Maddiotto et al.* do not specifically disclosed the corner frequency of said analog lowpass filter and the bandwidth and dynamic range of said analog-to-digital converter are adjustable, and said digital downmixing and adder logic is deactivated when not needed. However, such adjustable AD converter and quadrature downmixing is well known, as taught by *Torii* (see abstract, col. 4/ln. 39-col.

6/ln. 11). Therefore, it would have been obvious to one of ordinary skill in the art to provide such adjusting AD converter and method of quadrature downmixing as taught by *Torii* to the broad band receiver of *Maddiotto et al.* to suppress interference signal automatically and to effectively transfer data at high speed.

As per claims 7, 16, and 25, the modified system of *Maddiotto et al.* further disclosed the receiver further comprises a switch structure for bypassing an RF mixer and an IF filter used for single carrier reception (see abstract, col. 4/ln. 39-col. 6/ln. 11).

5. Claims 8, 17, and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over *Maddiotto et al.* (6,690,735) in view of *Wynn* (6,009,317).

As per claims 8, 17, and 26, *Maddiotto et al.* do not specifically disclosed digital logic for compensating amplitude and phase imbalances between the digital I and Q signals. However, such method for compensating amplitude and phase imbalances between the digital I and Q signals are well known, as taught by *Wynn* (see abstract, Fig. 1-3, col. 5/ln. 10-col. 9/ln. 35). Therefore, it would have been obvious to one of ordinary skill in the art to provide such method for compensating amplitude and phase imbalances between the digital I and Q signals as taught by *Wynn* to the broad band receiver of *Maddiotto et al.* to provide a receiver that accurately quadrature demodulated and compensate the quadrature imbalance of the received complex signals.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Glas (6,330,290), Suzuki (6,088,406), Ozluturk et al. (6,377,620), Lindquist et al. (6,373,909), Velez et al. (6,266,377), and Mogre et al. (6,122,325) disclose radio receiver for use in a radiotelephone communication system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pablo Tran whose telephone number is (703)308-7941. The examiner normal hours are 9:30 -5:00 (Monday-Friday). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

PABLO N. TRAN
PRIMARY EXAMINER

April 5, 2004